

10573924

DETAILED ACTION

Information Disclosure Statement

1. The Information Disclosure Statements filed 3/30/06, 4/24/07, 4/12/10, 6/4/10, and 9/1/10 have been considered.

Election/Restrictions

2. Applicant's election with traverse of claims 39 and 56 in the reply filed on October 19, 2010 is acknowledged. The traversal is on the grounds that the species are not in fact species. This is found partially persuasive. The claims to the types of fuel are rejoined. Claims 46 and 49 are rejoined. Claims 34-36 are recognized as being drawn to a separate species from claims 37-39. Since Applicant elected claim 39, claims 37 and 38 are rejoined. Claims 34-36 are rejoined.
3. Claims 31-60 are pending. Claims 34-36 are withdrawn. Claims 31-33 and 37-60 are rejected for the reasons given below.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 31-33, 37-44, 47, and 49-52 are rejected under 35 U.S.C. 102(b) as being anticipated by Steele et al. (US 2002/0048699).

Steele et al. teach a solid oxide fuel cell having an anode, a cathode, and an electrolyte (abstract).

With further regard to claim 31 and regarding claims 32 and 33, Steele et al. teach that one of the two electrodes comprises a mixture of doped ceria and perovskite oxide containing iron and cobalt ([0038], [0039], [0041]).

Steele et al. teach that the anode may comprise doped ceria and a perovskite metal such as discussed below ([0068]).

As for claims 37-39, Steele et al. teach that the perovskite is a lanthanum strontium cobalt iron oxide, $\text{La}_{0.6}\text{Sr}_{0.4}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_{3-\delta}$ ([0041]).

Regarding claim 40, Steele et al. teach only ceramic materials in the electrode ([0039]).

Regarding claims 41-43, Steele et al. teach that the doped ceria is gadolinia-doped, and that the ratio of ceramic to doped ceria is 60:40 ([0039], [0043]).

As for claim 44, Steele et al. teach that the ceria is doped with a rare earth element ([0042]).

Regarding claim 47, Steele et al. teach that the doped ceria particles are 0.1 - 1.0 μm ([0066]).

As for claims 49 and 50, Steele et al. teach a cathode comprising a lanthanum strontium cobalt iron oxide and doped ceria ([0067]).

Regarding claim 51, Steele et al. teach that the electrolyte comprises doped ceria ([0051]).

As for claim 52, the electrolyte is not supporting, since the electrodes are supported by substrates (abstract).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 45, 46, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steele et al. as applied to claim 31 above.

The teachings of Steele et al. as discussed above are incorporated herein.

Regarding claims 45 and 46, Steele et al. teach that the doped ceria is $\text{Ce}_{0.9}\text{Gd}_{0.1}\text{O}_{1.95}$ ([0043]). The amount of dopant is 10%, which is considered to be about 20%.

As for claim 48, Steele et al. teach that the particles may be $0.1\ \mu\text{m}$ ([0066]).

Steele does not teach the specific doped ceria, $\text{Ce}_{0.8}\text{Gd}_{0.2}\text{O}_{1.90}$, of the claims. It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a *prima facie* rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of

Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). The examiner finds that it would have been within the ordinary level of skill in the art that the doped ceria of Steele et al. would have the same results as the doped ceria of the claims since the difference in value is minor.

8. Claims 53-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steele et al. in view of Gorte et al. (S 2001/0053471).

The teachings of Steele et al. as discussed above are incorporated herein.

Steele et al. teach the claimed solid oxide fuel cell but fail to teach explicitly a method of producing energy from the fuel cell.

While the examiner holds that the skilled artisan would recognize that it is inherent that energy would be produced when a fuel is provided to the anode and an oxidant is provided to the cathode, it is also found that Gorte et al. teach a method of generating electricity in a solid oxide fuel cell by providing a fuel to the anode and an oxidant to the cathode (abstract).

As for claim 55, Gorte et al. teach the use of alcohol as the fuel (page 5 column 2).

Regarding claims 57-59, Gorte et al. teach dry liquid methane as the fuel ([0010], [0028]).

The skilled artisan could have applied the method of Gorte et al. to the fuel cell of Steele et al. and the results would have been predictable. MPEP 2141 III

Regarding claims 54, 56, and 60, Gorte et al. teach that it was known in the art to use gaseous fuels such as hydrogen in solid oxide fuel cells, and that it was known to internally reform fuel in the anode side ([0005], [0006], [0028]).

One of ordinary skill in the art could have substituted one of the known elements of fuel and reforming in the fuel cell system of Steele et al. and the results of the substitution would have been predictable. MPEP 2141 III

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ula Ruddock can be reached on 571-272-1481. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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